

SYSTEM:OS - DIALOG OneSearch

File 2:INSPEC 1969-2002/Feb W1

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File 6:NTIS 1964-2002/Feb W4

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*File 6: See HELP CODES6 for a short list of the Subject Heading Codes
(SC=, SH=) used in NTIS.

File 8:EI Compendex(R) 1970-2002/Feb W1

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File 34:SciSearch(R) Cited Ref Sci 1990-2002/Feb W2

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Set Items Description

?s (py<2000 or pd<19990422) and (high(2W)(k or dielectric) or tantalum(w)oxide)(10n)(di
electric or insulator or insulating or insulation) and (anneal? or oxidis? or oxidiz? o
r oxidation)(10n)(water or steam or wet)
>>>One or more prefixes are unsupported
>>> or undefined in one or more files.

Processing

Processing

21671391	PY<2000
2331389	PD<19990422
3788453	HIGH
1124156	K
278964	DIELECTRIC
20634	HIGH(2W)(K OR DIELECTRIC)
34212	TANTALUM
511531	OXIDE
1570	TANTALUM(W)OXIDE
278964	DIELECTRIC
92224	INSULATOR
95541	INSULATING
81249	INSULATION
8747	(HIGH(2W)(K OR DIELECTRIC) OR TANTALUM(W)OXIDE)(10N)((DIELECTRIC OR INSULATOR) OR INSULATING) OR INSULATION)
274122	ANNEAL?
8947	OXIDIS?
111560	OXIDIZ?
356607	OXIDATION
1285276	WATER
107642	STEAM
89408	WET
28150	((ANNEAL? OR OXIDIS?) OR OXIDIZ?) OR OXIDATION)(10N)((WATER OR STEAM) OR WET)
S1	6 (PY<2000 OR PD<19990422) AND (HIGH(2W)(K OR DIELECTRIC) OR TANTALUM(W)OXIDE)(10N)(DIELECTRIC OR INSULATOR OR INSULATING OR INSULATION) AND (ANNEAL? OR OXIDIS? OR OXIDIZ? OR OXIDATION)(10N)(WATER OR STEAM OR WET)

?rd

...completed examining records

S2 6 RD (unique items)

↑
none relevant

SYSTEM:OS - DIALOG One Arch

File 2:INSPEC 1969-2002/Feb W1

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File 8:Ei Compendex(R) 1970-2002/Feb W1

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Set Items Description

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>>>One or more prefixes are unsupported

>>> or undefined in one or more files.

Processing

11167637	PY<2000
20578	PD<19990422
2101006	HIGH
632017	K
204588	DIELECTRIC
10333	HIGH(2W) (K OR DIELECTRIC)
22693	TANTALUM
248962	OXIDE
1097	TANTALUM(W) OXIDE
114939	GATE
204588	DIELECTRIC
1949	GATE(2N) DIELECTRIC
71644	INSULATOR
77908	INSULATING
61678	INSULATION
405	(HIGH(2W) (K OR DIELECTRIC) OR TANTALUM(W) OXIDE) (10N) ((GATE(2N) DIELECTRIC OR INSULATOR) OR INSULATING) OR INSULATION)
196411	ANNEAL?
4168	OXIDIS?
45389	OXIDIZ?
138271	OXIDATION
S1 41	(PY<2000 OR PD<19990422) AND (HIGH(2W) (K OR DIELECTRIC) OR TANTALUM(W) OXIDE) (10N) (GATE(2N) DIELECTRIC OR INSULATOR OR INSULATING OR INSULATION) AND (ANNEAL? OR OXIDIS? OR OXIDIZ? OR OXIDATION)

?rd

...completed examining records

S2 35 RD (unique items)

2/9/3 (Item 3 from le: 2)

DIALOG(R) File 2:INSPEC

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6558547 INSPEC Abstract Number: B2000-05-0520F-096

Title: Atomic layer deposition of Ta/sub 2/O/sub 5/ films using Ta(OC/sub 2/H/sub 5/)/sub 5/ and NH/sub 3/

Author(s): Hyun-Jung Song; Wonyong Koh; Sang-Won Kang

Author Affiliation: Dept. of Mater. Sci. & Eng., Korea Adv. Inst. of Sci. & Technol., Seoul, South Korea

Conference Title: Ultrathin SiO/sub 2/ and High-K Materials for ULSI Gate Dielectrics. Symposium p.469-71

Editor(s): Huff, H.R.; Richter, C.A.; Green, M.L.; Lucovsky, G.; Hattori, T.

Publisher: Materials Research Society, Warrendale, PA, USA

Publication Date: 1999 Country of Publication: USA xvii+615 pp.

Material Identity Number: XX-1999-02940

Conference Title: Ultrathin SiO/sub 2/ and High-K Materials for ULSI Gate Dielectrics. Symposium

→ Conference Date: 5-8 April 1999 Conference Location: San Francisco, CA, USA

Language: English Document Type: Conference Paper (PA)

Treatment: Experimental (X)

Abstract: Tantalum oxide films were grown by chemical vapor deposition using an alternating supply of tantalum pentaethoxide and ammonia. The supply of one source was followed by a purge with argon gas before introducing the other source onto the substrate in order to prevent gas-phase reactions. At substrate temperature between 250-275 degrees C the film growth depended only on the number of source supply cycles (0.15 nm/cycle) and did not depend on the substrate temperature nor supply time of the sources. As-deposited films were amorphous, however, were crystallized after **annealing** at 800 degrees C in oxygen atmosphere by rapid thermal process. **Annealed** films showed increased dielectric constant and decreased leakage current density, which were 13.3 and 6.6 mu A/cm/sup 2/ at 1 MV/cm, respectively, for a 15-nm-thick film after **annealing** at 800 degrees C for 10 minutes. (5 Refs)

Subfile: B

Descriptors: chemical vapour deposition; dielectric thin films; leakage currents; permittivity; rapid thermal **annealing**; tantalum compounds

Identifiers: atomic layer deposition; tantalum oxide film; chemical vapor deposition; tantalum pentaethoxide; ammonia; rapid thermal **annealing**; dielectric constant; leakage current density; **high - K gate dielectric**; 250 to 275 C; 800 C; Ta/sub 2/O/sub 5

2/9/10 (Item 10 from file: 2)

DIALOG(R) File 2:INSPEC

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6021766 INSPEC Abstract Number: A9820-6822-017, B9810-2530F-029

Title: Intermixing at the tantalum oxide /silicon interface in gate dielectric structures

Author(s): Alers, G.B.; Werder, D.J.; Chabal, Y.; Lu, H.C.; Gusev, E.P.; Garfunkel, E.; Gustafsson, T.; Urdahl, R.S.

Author Affiliation: Lucent Technol., AT&T Bell Labs., Murray Hill, NJ, USA

Journal: Applied Physics Letters vol.73, no.11 p.1517-19

Publisher: AIP,

Publication Date: 14 Sept. 1998 Country of Publication: USA

CODEN: APPLAB ISSN: 0003-6951

SICI: 0003-6951(19980914)73:11L:1517:ITOS;1-1

Material Identity Number: A135-98037

U.S. Copyright Clearance Center Code: 0003-6951/98/73(11)/1517(3)/\$15.00

Document Number: S0003-6951(98)04637-3

Language: English Document Type: Journal Paper (JP)

Treatment: Applications (A); Practical (P); Experimental (X)

Abstract: Metal oxides with high dielectric constants have the potential to extend scaling of transistor gate capacitance beyond that of ultrathin silicon dioxide. However, during deposition of most metal oxides on silicon, an interfacial region of SiO/sub x/ can form that limits the specific capacitance of the gate structure. We have examined the composition of this layer using high-resolution depth profiling of medium ion energy scattering combined with infrared spectroscopy and transmission electron microscopy. We find that the interfacial region is not pure SiO/sub 2/, but is a complex depth-dependent ternary oxide of Si-Ta/sub x/-O/sub y/ with a dielectric constant at least twice that of pure SiO/sub 2/ as inferred from electrical measurements. High-temperature annealing crystallizes the Ta/sub 2/O/sub 5/ film and converts the composite oxide to a more pure SiO/sub 2/ layer with a lower capacitance density. Using low postanneal temperatures, a stable composite oxide structure can be obtained with good electrical properties and an effective SiO/sub 2/ thickness of less than 2 nm with ~10 nm of composite oxide. (10 Refs)

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2/9/11 (Item 11 from file: 2)

DIALOG(R) File 2:INSPEC

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5967132 INSPEC Abstract Number: A9816-7755-022, B9808-2810D-005

Title: Tantalum pentoxide (Ta/sub 2/O/sub 5/) thin films for advanced dielectric applications

Author(s): Chaneliere, C.; Autran, J.L.; Devine, R.A.B.; Balland, B.

Author Affiliation: Lab. de Phys. de la Matiere, Inst. Nat. des Sci. Appliquees de Lyon, Villeurbanne, France

Journal: Materials Science & Engineering R: Reports vol.R22, no.6
p.269-322

Publisher: Elsevier,

Publication Date: 25 May 1998 Country of Publication: Switzerland

CODEN: MIGIEA ISSN: 0927-796X

SICI: 0927-796X(19980525)R22:6L.269:TPTT;1-E

Material Identity Number: B323-98012

U.S. Copyright Clearance Center Code: 0927-796X/98/\$19.00

Document Number: S0927-796X(97)00023-5

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X); Theoretical (T); General, Review (G)

Abstract: This paper reviews the present knowledge on tantalum pentoxide (Ta/sub 2/O/sub 5/) thin films and their applications in the field of microelectronics and integrated microtechnologies. Different methods used to produce tantalum oxide layers are described, emphasizing elaboration mechanisms and key parameters for each technique. We also review recent advances in the deposition of Ta/sub 2/O/sub 5/ in the particular field of microelectronics where high quality layers are required from the structural and electrical points of view. The physical, structural, optical, chemical and electrical properties of tantalum oxide thin films on semiconductors are then presented and essential film parameters, such as optical index, film density or dielectric permittivity, are discussed. After a reminder of the basic mechanisms that control the bulk electrical conduction in insulating films, we carefully examine the origin of leakage currents in Ta/sub 2/O/sub 5/ and present the state-of-the-art concerning the insulating behaviour of tantalum oxide layers. Finally, applications of tantalum oxide thin films are presented in the last part of this paper. We show how Ta/sub 2/O/sub 5/ has been employed as an antireflection coating, insulating layer, gate oxide, corrosion resistant material, and sensitive layer in a wide variety of components, circuits and sensors. (324 Refs)

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2/9/13 (Item 13 from File: 2)

DIALOG(R) File 2:INSPEC

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5271240 INSPEC Abstract Number: A9612-7755-005, B9607-2810F-005

Title: Stability of BaTiO/sub 3/ thin films on Si

Author(s): Chang, L.H.; Anderson, W.A.

Author Affiliation: Dept. of Electr. & Comput. Eng., State Univ. of New York, Buffalo, NY, USA

Journal: Applied Surface Science Conference Title: Appl. Surf. Sci. (Netherlands) vol.92 p.52-6

Publisher: Elsevier,

Publication Date: Feb. 1996 Country of Publication: Netherlands

CODEN: ASUSEE ISSN: 0169-4332

SICI: 0169-4332(199602)92L:52:SBTF;1-8

Material Identity Number: I974-96003

U.S. Copyright Clearance Center Code: 0169-4332/96/\$15.00

Conference Title: Seventh International Conference on Solid Films and Surfaces

Conference Date: 12-16 Dec. 1994 Conference Location: Hsinchu, Taiwan

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Applications (A); Practical (P); Experimental (X)

Abstract: A very high quality BaTiO/sub 3//p-Si interface and BaTiO/sub 3/ **insulator** gates with **high dielectric** constant and low leakage current were produced by RF magnetron sputtering of BaTiO/sub 3/ on (100) p-Si at a substrate temperature of 500 degrees C, followed by in situ **annealing** at 500 degrees C for 10 min. The reliability of the dielectric, however, plays an important role in determining the practical usage of ferroelectric random access memory applications. Thermal treatment of Au/BaTiO/sub 3//Si capacitors at 150 degrees C for 800 h showed no change of leakage current and a slight increase in leakage from 1.1×10^{-9} A/cm/sup 2/ for the as-deposited BaTiO/sub 3/ to 1.8×10^{-9} A/cm/sup 2/ for the samples after 1000 h at a field of 1.3×10^5 V/cm. The effects of fatigue were also studied and found to not affect the electrical and charge properties of BaTiO/sub 3/ on Si for 10^{10} cycles of fatigue.
(8 Refs)

2/9/28 (Item 3 from File: 8)
DIALOG(R) File 8: Ei Compendex(R)
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05252377 E.I. No: EIP99034599443

Title: Effect of barrier layer on the electrical and reliability characteristics of high - k gate dielectric films

Author: Jeon, Yongjoo; Lee, Byoung Hun; Zawadzki, Keith; Qi, Wen-Jie; Lucas, Aaron; Nieh, Renee; Lee, Jack C.

Corporate Source: Univ of Texas at Austin, Austin, TX, USA

Conference Title: Proceedings of the 1998 IEEE International Electron Devices Meeting

Conference Location: San Francisco, CA, USA Conference Date: 19981206-19981209

Sponsor: IEEE

E.I. Conference No.: 49917

Source: Technical Digest - International Electron Devices Meeting 1998. IEEE, Piscataway, NJ, USA, 98CH36217. p 797-800

Publication Year: 1998

CODEN: TDIMD5 ISSN: 0163-1918

Language: English

Document Type: CA; (Conference Article) Treatment: X; (Experimental)

Journal Announcement: 9905W2

Abstract: Electrical and reliability characteristics of several metal/high-k/(barrier layer)/Si capacitor structures have been investigated. The equivalent oxide thickness (EOT) increased as the **annealing** temperature increased, especially in oxygen ambient. Jet vapor-deposited (JVD) nitride was found to be a good **oxidation** barrier which is important for achieving thin EOT. Introducing TiO//2 as a barrier layer reduced the leakage current and EOT of Pt/BST/Si capacitor. The conduction mechanism in Pt/TiO//2/Si structure was found to be tunneling-like behavior limited by the interfacial layer. Hysteresis could be minimized by the optimization of the **annealing** process. In reliability characteristics, TiO//2 revealed no significant degradation and exhibited better wear-out properties than conventional SiO//2. (Author abstract) 6 Refs.

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